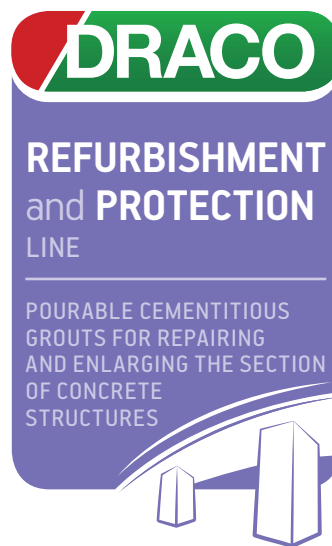
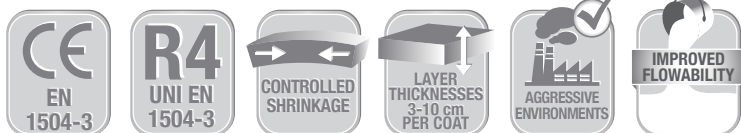


# FLUECO 60

POURABLE, SHRINKAGE-COMPENSATED, RHEODYNAMIC CEMENTITIOUS CONCRETE MIX WITH SPECIAL SYNTHETIC POLYACRYLONITRILE (PAN) FIBRES, FOR THICK, HIGHLY DURABLE STRUCTURAL SURFACING  
*Layer thickness from 3 to 10 cm*



**FLUECO 60** is a shrinkage-compensated rheodynamic concrete consisting of a premix based on high-strength cements, viscosity modifying polymers and selected siliceous aggregates, and enriched with special synthetic PAN (polyacrylonitrile) fibres. The specific formulation guarantees high impermeability and durability even in aggressive environments.

**FLUECO 60** is particularly suitable for pouring into formwork to repair reinforced concrete structures, even ones that are heavily reinforced.

## BENEFITS

The characteristics of **FLUECO 60** make it suitable for maintenance, lifts and structural repairs of concrete buildings subject to high physical, chemical and environmental attacks. The specific characteristics of the product are:

- ✓ **RESISTANCE TO AGGRESSIVE AGENTS:** **FLUECO 60** is not subject to carbonation and shows high resistance to aggressive agents present in the environment such as chlorides and sulphates. Thanks to the chemical and physical characteristics of its components and its compact structure it is totally waterproof and resistant to thermal variations.
- ✓ **ABSENCE OF CRAZING AND CRACKS CAUSED BY PLASTIC SHRINKAGE:** **FLUECO 60** has no crazing or plastic shrinkage cracks even with prolonged curing, prolonging the useful life of the building and reducing maintenance.
- ✓ **CONTRASTED EXPANSION WHEN EXPOSED TO AIR:** used together with the curing additive **PRESIDIO SRA** it permits the development of expansive properties even when cured in the open air both in the plastic and hardened phases, thus preventing cracking and shrinkage.
- ✓ **MAXIMUM FLUIDITY:** thanks to its fluid consistency and the additives it contains, **FLUECO 60** flows easily even when there is complex reinforcement, thus facilitating its installation even when working on large surfaces.
- ✓ **HIGH ADHESION AND PULL-OUT RESISTANCE:** **FLUECO 60** was specifically formulated to increase adhesion to steel and concrete ensuring excellent resistance to the slipping of steel rods. No dripping or wastage.



## WHERE TO USE

**FLUECO 60** should be used for the structural repair, maintenance and restoration of damaged concrete and reinforced concrete structures exposed to highly aggressive environments. **FLUECO 60** is particularly suitable for:

- ✓ pouring restoration layers into formworks with a thickness ranging from 3 to 10 cm;
- ✓ maintaining and reinforcing concrete slabs, load-bearing slabs and docks even in aggressive environments;
- ✓ columns, viaducts, armour-plating and underpinning, application on fibre/cement and/or plaster to create a pleasant colour and an attractive finish.

For thickness greater than 10 cm, incorporate in **FLUECO 60** up to 30%, by weight, of washed aggregates with a minimum grain size of at least 6 mm and a maximum diameter depending on the thickness of the placed concrete.

## APPLICATION INSTRUCTIONS

### SUBSTRATE CLEANING

- ▶ **Remove all flaking parts** 1 from the concrete in the area to be repaired, including grout slurry, either by mechanical chipping or pressure washing and taking care not to damage the structures.
- ▶ **Remove spots, efflorescence or soaked-in stains** of grease oils, paints, lime, dust, dirt etc.
- ▶ **Remove any earlier repairs** if irreparably damaged or deteriorated.

### SUBSTRATE PREPARATION

- ▶ **Roughen the surface** mechanically by bush hammering, chiselling or pressure washing (this last avoids damage to the substrate and is recommended for large areas) to reach the sound, compact concrete and enhance bonding between the mortar and substrate. The surface should be roughened with unevenness to a depth of at least 5 mm while the edges around the area to be repaired must be scarified to a depth of at least 10 mm with a sharp edge finish. Roughening of the surface layer is needed both to promote bonding of the mortar, and to ensure the expansive properties develop correctly.
- ▶ **Wet the surface with water under pressure to saturation.** This procedure avoids the substrate absorbing water from the mix as this could lead to cracking and reduce the bonding strength of the mortar. This operation also allows the removal of any fragments remaining from the roughening of the concrete substrate. Excess water must be removed with compressed air jets or with rags.

### REBAR PROTECTION

- ▶ **Sandblast the rebars** and remove all loose particles such as rust flakes or fragments of material that could lead to corrosion or impair bonding. Scarification of the substrate with hydro-blasting also effectively cleans the bars, making sandblasting unnecessary.
- ▶ **Protect the reinforcement bars** by re-alkalising them with the corrosion-inhibiting agent **DRACOSTEEL**.

### ADDITIONAL REINFORCEMENT FOR STRUCTURAL REQUIREMENTS

**Structural reinforcement:** If the designer requires extra reinforcement for technical or structural reasons it is possible to apply an electro-welded mesh with the use of spacers (at least 1 cm from the substrate) and rebar covers of at least 1.5 - 2 cm.

**Steel reinforcing rods:** To ensure that the expansive properties of the grout are contrasted adequately, especially where the reinforcement is limited or at the edges of the cast it is advisable to insert an electro-welded mesh, with 5 mm diameter and 5x5 mesh size. The mesh should be anchored by nailing.

### FORMWORK

**FLUECO 60** can be installed by casting, including pouring into formwork. However, the maximum recommended thickness must not be exceeded. The formwork must be waterproof and adequately anchored and sealed to prevent absorption of the mixing water, leakage of material or blowout of the sides due to the pressure created by the jet of mortar. When wooden formwork is used, this must be saturated with water to prevent the wood absorbing water from the mix. A pouring channel and opening of approx- 20 cm must be formed to ensure the casting is performed correctly.

## GROUT PREPARATION

The mixing of the mortar **FLUECO 60** is carried out using an on-site concrete mixer. Pour the mixing water into the cement mixer according to the recommended mixing ratios indicated in the Table. Add slowly, mixing for at least 4 to 5 minutes until the mix is smooth and free of lumps. Make sure that all the product has been properly mixed in and that there are no residues of powder on the sides or bottom of the concrete mixer. To prepare small batches of product use a suitable vessel or container and respect the recommended mixing proportions. We recommend the use of a mechanical agitator at low speed to reduce air entrapment. **PRESIDIO SRA**, added to the mix at a dosage of 1 % on the weight of the mortar (0.25 kg per bag) acts as internal curing, and enhances the expansive properties in the open air. **PRESIDIO SRA** affects the curing of the mortar, so the dosage should be adjusted on the basis of the ambient temperature. In warm climates **PRESIDIO SRA** permits good workability; when ambient temperatures range between 5 and 10 °C we recommend reducing the dosage to avoid excessive slowing down of the setting time.



## PRECAUTIONS IN HOT CLIMATES

- ▶ Store **FLUECO 60** away from direct sunlight;
- ▶ use low temperature mixing water;
- ▶ carry out the work in the early hours of the morning, and stop work when the sun is strongest. It is better to resume working in the late afternoon, as long as the structure has been wet continuously for at least 6 hours before work starts;
- ▶ to achieve optimum performance from **FLUECO 60** you should ensure proper curing by applying PROBETON CURING N by spray or by brush.



## PRECAUTIONS IN COLD CLIMATES

- ▶ Store **FLUECO 60** in a heated environment;
- ▶ do not use the product at temperatures below +5 ° C;
- ▶ start work in the later hours of the morning;
- ▶ make sure that the substrate is not frozen.

## SUBSTRATE SATURATION WITH WATER

Carry out all the procedures to prepare the substrate then saturate the concrete or masonry with hot water continuously for at least 3 hours before casting **FLUECO 60**. Any excess water on the surface must be removed with compressed air or cloths.

## APPLICATION

**FLUECO 60** can be applied by pouring or by casting in formwork. The product must be applied on clean, roughened surfaces that have been saturated with water as described in the previous paragraph. **FLUECO 60** is applied in single layers up to a thickness of 10 cm.

For applications requiring a thickness greater than 10 cm it is necessary to add washed, impurity-free aggregates, with a minimum diameter of at least 10 mm and a maximum diameter according to the size of the jet, at 35% of the total weight of the dry mix.

Level the surfaces by smoothing the mortar and removing surface bubbles.

Avoid overworking when floating as this can cause pull-off cracking.

Pumping mortar into formwork requires specific precautions to ensure it is installed correctly: the casting must be done slowly and only on one side to facilitate the expelling of air. Thanks to its rheological properties and superior fluidity **FLUECO 60** easily fills spaces even where the reinforcement is complex or thick. It is not necessary to vibrate the mortar.

## CURING

When PRESIDIO SRA is added to the mix at a dosage of 1 % on the weight of the mortar it acts as internal curing and regulates water evaporation, reducing shrinkage and cracking and enhancing curing. The addition of PRESIDIO SRA to **FLUECO 60** enables correct expansion in air thus reducing shrinkage by 20-50 % compared to the use of the product without the additive. To ensure proper curing of the product even in dry climates, or where surfaces are exposed to excessively windy or sunny conditions, we in any case recommend the use of the curing membrane PROBETON CURING N applied with a roller or airless sprayer.

## PACKAGING AND STORAGE

FLUECO 60 is packaged in:

- ▶ 25 kg bags
- ▶ 1200 kg big bag

If kept in its original packaging and properly stored under cover in a dry place, the product maintains its characteristics for a year.



## PRODUCT CHARACTERISTICS

APPEARANCE AND COLOUR	Grey powder
MAXIMUM AGGREGATE SIZE	6 mm
TYPE OF FIBRES	PAN 6 mm (polyacrylonitrile)
CHLORIDE ION CONTENT - UNI EN 1015-17	≤ 0,05%
PACKAGING	25 kg bags 1200 kg big bag

## APPLICATION DATA

MIX COLOR	Grey
MIXING WATER	2.75 - 3.25 litres per bag
DENSITY OF MIX - UNI EN 12190	2320 kg/m <sup>3</sup>
MIX CONSISTENCY WORKABILITY OF POURABLE MORTARS - UNI EN 13395-3	> 35 cm
SPREADING OF FLUECO 60 - UNI EN 12350-8	Approx. 800-900 mm (*)
SPREADING OF FLUECO 60 + INERT 6/9 (max. 35% by weight of gravel) - UNI EN 12350-8	> 600 mm (the nature and quality of the aggregate influence the parameter)
TEMPERATURE OF USE	+5° C to +35° C
POT LIFE OF MIX	approx. 60 minutes (20° C - 50% RH)
COMPLETE HARDENING	approx. 28 days at 20° C
WAITING TIME BETWEEN COATS	at least approx. 30 minutes (23° C - 50% RH)
THICKNESS OF APPLICATION	10 cm
CONSUMPTION	approx. 21 kg/m <sup>2</sup> circa per cm of thickness

\*Requirement satisfied by adding PRESIDIO SRA to FLUECO 60.

## TECHNICAL SPECIFICATIONS



**FLUECO 60**, produced by **Draco Italiana SpA**, is a cementitious grout that is fibre-reinforced, shrinkage-compensated and sulphate resistant used for the structural repair and restoration of concrete structures and casting in formwork. The product is to be applied in thicknesses from 3 to 10 cm per layer. The mortar must be characterised by high adhesion to the substrate, water-tightness and development of high initial and final mechanical strength and must comply with the requirements of EN 1504-3 for class R4 structural mortars. All instructions and precautions followed must comply with the recommendations given by the manufacturer: **Draco Italiana SpA**.

**FINAL PERFORMANCE** 13 % MIXING WATER FLUID CONSISTENCY (20° C - 65% RH)

CHARACTERISTICS	TEST METHOD	REQUIREMENTS IN ACCORDANCE WITH PERFORMANCE EN-1504-3 FOR CLASS R4 MORTARS	PRODUCT PERFORMANCE (*)
COMPRESSIVE STRENGTH	EN 12190	≥ 45 MPa (after 28 days)	> 30 MPa at 1 day > 55 MPa at 7 days > 70 MPa at 28 days
FLEXURAL STRENGTH	EN 196/1	None	> 4 MPa at 1 day > 7 MPa at 7 days > 9 MPa at 28 days
COMPRESSIVE MODULUS OF ELASTICITY	UNI EN 13412 - UNI EN 6556	≥ 20 GPa (after 28 days)	30 (± 2) GPa
BOND STRENGTH ON CONCRETE (substrate of type MC 0.40 w / c ratio = 0.40) according to EN 1766	EN 1542	≥ 2 MPa (after 28 days)	> 2 MPa
RESTRAINED EXPANSION	UNI 8148 modified	None	1 g > 0,04 % Inarc. n
ARCHING TEST	-	None	Convex arching
CRACK RESISTANCE	"O Ring Test"	None	No cracking at 180 days
RESISTANCE TO ACCELERATED CARBONATATION	EN 13295	Depth of carbonatation ≤ reference concrete (MC 0.45 w / c ratio = 0.45) according to UNI 1766	Meets specifications
IMPERMEABILITY TO WATER -penetration depth-	EN 12390/8	None	< 5mm
CAPILLARY ABSORPTION	EN13057	≤ 0,5 kg/m <sup>2</sup> · h <sup>0,5</sup>	< 0,1 kg/m <sup>2</sup> · h <sup>0,5</sup>
PULL OUT RESISTANCE OF STEEL RODS	RILEM - CEB - FIP RC6/78	None	> 25 MPa
THERMAL COMPATIBILITY measured as bond strength according to EN 1542 on concrete type MC 0.4 UNI EN 1766: freeze-thaw cycles with de-icing salts (1), thunder-shower cycles (2), dry thermal cycles (4)	EN 13687/1-2-4	≥ 2 MPa (after 50 cycles)	> 2 MPa
REACTION TO FIRE	EN 13501-1	Euroclass A1	A1

\* Specification satisfied with the addition of PRESIDIO SRA to FLUECO 60

**NOTE:** The indicated performance ratings are obtained with spreading at 800-900 mm according to EN 12350-8

**Legal notice** - SLCMP version dated 01.03.2017

In the technical specifications herein, Draco Italiana s.p.a. used the indicators therein specified, with the relevant standards. Please check if this Sheet and the figures therein contained apply to the product batch you are interested in or if they have been overridden by any later release. If in doubt, check whether this Sheet matches the one applicable at the time of finalising the sales agreement, at [www.draco-edilizia.it](http://www.draco-edilizia.it), and/or contact our Engineering Department. No advice provided by our staff, either verbally or in writing at your request, about the potential applications of the Products shall be binding under the sales agreement or shall be considered an integral part of the agreement. Such advice is based on our experience and on the best available practical and/or scientific knowledge; as such, it shall not be binding or conditional on the buyer or user. Please try our products first to find out whether they are fit for your intended use or application; in any case, you shall be solely responsible for your choice.

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